IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A protection relay for determining whether or not a ~~faultal~~ fault point of a power system exists in a predetermined range, comprising:

filter means for inputting sampling data of a voltage and a current in the power system to a digital filter having a predetermined transfer function and outputting [[a]] first voltage data and [[a]] first current data, and [[a]] second voltage data and [[a]] second current data normal to the first voltage data and the first current data, respectively;

calculation means for calculating a predetermined measurement value based on the first voltage data, the first current data, the second voltage data and the second current data at a first time and the first voltage data, the first current data, the second voltage data and the second current data at a second time different from the first time; and

operation decision means for performing an operation decision based on the predetermined measurement value obtained by the calculation means, wherein

the filter means comprises:

first filter means for inputting the sampling data to a digital filter having a first transfer function $f(Z) \cdot (1+k \cdot Z^{-1}+Z^{-2})$ (Z indicates a Z conversion operator) so as to output the first voltage data and the first current data; and

second filter means for inputting the sampling data to a digital filter having a second transfer function $f(Z) \cdot (1-Z^{-2})$ so as to output the second voltage data and the second current data.

Claim 2 (Currently Amended): The protection relay according to claim 1, wherein the predetermined measurement value obtained by the calculation means ~~contains~~ comprises at least one of a reactance value and an [[Ohm]] ohmic value.

Claim 3 (Currently Amended): The protection relay according to claim 2, wherein ~~the filter means comprises:~~

~~first filter means for inputting~~ the sampling data is v_m and i_m at the first time [[T_m]] t_m ~~to a digital filter having transfer function $f(Z) \cdot (1+k \cdot Z^{-1}+Z^{-2})$ (Z indicates a Z conversion operator) so as to output;~~

the first voltage data is v_{sm} and the first current data is i_{sm}; and

~~second filter means for inputting the sampling data v_m, i_m at the first time T_m is inputted to a digital filter having transmission $f(Z) \cdot (1-Z^{-2})$ (Z indicates a Z conversion operator) so as to output~~ the second voltage data is v_{jm} and the second current data is i_{jm} normal to the first voltage data v_{sm} and the first current data i_{sm},

the calculation means calculates a reactance value X_m based on:

$$X_m = \frac{-v_{sm} \cdot i_{sm-p} + i_{sm} \cdot v_{sm-p}}{-i_{jm} \cdot i_{sm-p} + i_{jm-p} \cdot i_{sm}}$$

using the first voltage data v_{sm}, the first current data i_{sm}, the second voltage data v_{jm} and the second current data i_{jm} at the first time t_m and the first voltage data v_{sm-p}, the first current data i_{sm-p}, the second voltage data v_{jm-p} and the second current data i_{jm-p} at the second time t_{m-p}, and

the operation decision means ~~has an operation decision section which~~ decides the operation based on the calculated reactance value X_m.

Claim 4 (Currently Amended): The protection relay according to claim 3, wherein the operation decision means decides the operation based on a decision expression [[of]] $X_m \leq X_s$ based on the reactance value X_m and a setting value X_s.

Claim 5 (Currently Amended): The protection relay according to claim 3, wherein the calculation means calculates an [[Ohm]] ohmic value R_m based on:

[[using]] the first voltage data v_{sm}, the first current data i_{sm}, the second voltage data v_{jm} and the second current data i_{jm} at the first time t_m and the first voltage data v_{sm-p}, the first current data i_{sm-p}, the second voltage data v_{jm-p} and the second current data i_{jm-p} at the second time t_{m-p}, the [[Ohm]] ohmic value R_m is calculated based on

$$R_m = \frac{-i_{jm} \cdot v_{sm-p} + v_{sm} \cdot i_{jm-p}}{-i_{jm} \cdot i_{sm-p} + i_{jm-p} \cdot i_{sm}}, \text{and}$$

the operation decision means decides the operation [[from]] based on the calculated reactance value X_m obtained from the calculation means according to a decision expression:

$$(R_m\text{-}R_0) \cdot (R_m\text{-}R_F) + (X_m\text{-}X_0) \cdot (X_m\text{-}X_F) \leq 0$$

where[[;]], R_0 ([[Ohm]] ohmic component) represents an offset mho near side setting value;

X_0 (reactance component) represents an offset mho near side setting value;

R_F ([[Ohm]] ohmic component) represents an offset mho far side setting value; and

X_F (reactance component) represents an offset mho far side setting value.

Claim 6 (Currently Amended): The protection relay according to claim 2, wherein ~~the filter means comprises: first filter means for inputting~~ the sampling data is v_m and i_m at the first time [[T_m]] t_m ~~to a digital filter having transfer function $f(Z) \cdot (1+k \cdot Z^{-1}+Z^{-2})$ (Z indicates a Z conversion operator) so as to output;~~

the first voltage data is v_{sm} and the first current data is i_{sm}; and

~~second filter means for inputting the sampling data v_m and i_m at the first time T_m to a digital filter having transmission $f(Z) \cdot (1-Z^{-2})$ (Z indicates a Z conversion operator) so as to output~~

the second voltage data is v_{jm} and the second current data is i_{jm} normal to the first voltage data v_{sm} and the first current data i_{sm}[[,]]; and

the calculation means calculates an [[Ohm]] ohmic value R_m using the first and second voltage data v_{sm}[[,]] and v_{jm}~~, v_{sm-p} and v_{jm-p}~~ and the first and second current data i_{sm}, and i_{jm}~~, i_{sm-p} and i_{jm-p}~~ at the first ~~and second times T_m~~ time t_m, and [[T_{m-p}]] the first and second voltage data v_{sm-p} and v_{jm-p} and the first and second current data i_{sm-p} and i_{jm-p} at the second time t_{m-p}, which are obtained by the first filter means and second filter means, and

the operation decision means decides the operation based on the [[Ohm]] calculated ohmic value R_m obtained from the calculation means.

Claim 7 (Currently Amended): A protection relay for determining whether or not a ~~faultal~~ fault point of a power system exists in a predetermined range, comprising:

filter means in which sampling data of voltage and current in the power system is inputted to a predetermined transfer function so as to output first voltage data and first current data and second voltage data and second current data normal to the first voltage data and the first current data, respectively;

polarized voltage value calculation means for inputting the first and second voltage data and the first and second current data so as to calculate a third voltage normal to the first voltage; and

operation decision means for performing an operation decision based on the third voltage, wherein

the filter means comprises:

first filter means for inputting the sampling data to a digital filter having a first transfer function $f(Z) \cdot (1+k \cdot Z^{-1}+Z^{-2})$ (Z indicates a Z conversion operator) so as to output the first voltage data and the first current data; and

second filter means for inputting the sampling data to a digital filter having a second transfer function $f(Z) \cdot (1-Z^{-2})$ so as to output the second voltage data and the second current data.

Claim 8 (Currently Amended): The protection relay according to claim 7, wherein

the polarized voltage value calculation means calculates [[a]] the third voltage v_{pjm} based on the first voltage data v_{sm}, the first current data i_{sm}, the second voltage data v_{jm}, and the second current data i_{jm}, and

the operation decision means decides the operation based on:

$$v_{pjm-p} \cdot \{(R_s \cdot i_{sm} + X_s \cdot i_{jm})-v_{sm}\}$$

$$-v_{pjm} \cdot \{(R_s \cdot i_{sm-p} + X_s \cdot i_{jm-p})-v_{sm-p}\} > K_2$$

using the third voltage v_{pjm}, the first voltage data v_{sm}, the first current data i_{sm}, the second voltage data v_{jm}, the second current data i_{jm} at the first time t_m and [[the]] first voltage data v_{jm-p}, [[the]] first current data i_{jm-p} at [[the]] a second time t_{m-p} and a setting value (R_s, X_s).

Claim 9 (Original): The protection relay according to claim 7, wherein the polarized voltage value calculation means calculates a voltage before predetermined cycles of a voltage normal to the first voltage as the third voltage.

Claim 10 (Currently Amended): A protection relay for determining whether or not a ~~faultal~~ fault point of a power system exists in a predetermined range, comprising:

first filter means for inputting sampling data v_m and i_m of a voltage v and a current i in the power system to a digital filter having a transfer function $f(Z) \cdot (1+k \cdot Z^{-1}+Z^{-2})$ (Z indicates a Z conversion operator) so as to output voltage data v_{sm} and current data i_{sm};

second filter means ~~in which~~ for inputting the sampling data $v_m[[,]]$ and i_m ~~are inputted~~ to a digital filter having a transfer function $f(Z) \cdot (1-Z^{-2})$ so as to output voltage data v_{jm} and current data i_{jm} normal to the voltage data v_{sm} and the current data i_{sm};

charging current compensation calculation means for calculating a quantity ~~of electricity defined in~~ $i_{sm}-C \cdot v_{jm}$ based on ~~by~~ the current data i_{sm}, the voltage data v_{jm}, and a setting value C_s at a time t_m;

transmission and reception means for transmitting an output of the charging current compensation calculation means to an opposite terminal and when said quantity ~~of electricity~~ at the opposite terminal is ~~assumed to be~~ B, receiving another quantity ~~of electricity~~ defined by $(i_{sm}-C \cdot v_{jm})B$ at the opposite terminal; and

operation decision means for performing an operation decision based on outputs from the charging current compensation calculation means and the ~~transmission/reception~~ transmission and reception means according to the following expression:

$$\| (i_{sm}-Cs \cdot v_{jm}) + (i_{sm}-Cs \cdot v_{jm}) B \| \geq$$

$$ka \cdot \{ \| i_{sm}-Cs \cdot v_{jm} \| + \| (i_{sm}-Cs \cdot v_{jm}) B \| \} + kb$$

where, $[[\| am \|]] \| \|$ represents ~~a quantity parallel to~~ an amplitude of an AC quantity ~~of electricity "a"~~ at the time t_m;

ka represents a proportion restricting coefficient; and

kb represents a minimum sensitivity current.

Claim 11 (Canceled).

Claim 12 (New): A protection relay for determining whether or not a fault point of a power system exists in a predetermined range, comprising:

a first digital filter having applied thereto inputs including sampling data of voltage and current of the power system and having a first transfer function $f(Z)\cdot(1+k\cdot Z^{-1}+Z^{-2})$ (Z indicates a Z conversion operator) so as to output first voltage data and first current data;

a second digital filter having applied thereto inputs including the sampling data of the voltage and the current of the power system and having a second transfer function $f(Z)\cdot(1-Z^{-2})$ so as to output second voltage data and second current data, said second voltage data and said second current data being normal to the first voltage data and the first current data, respectively;

a calculation device configured to calculate a predetermined measurement value based on the first voltage data, the first current data, the second voltage data and the second current data obtained from said first and second digital filters at a first time and at a second time, the second time being different from the first time; and

an operation device configured to perform an operation decision based on the calculated predetermined measurement value obtained from the calculation device.